

CLAIMS

What is claimed is:

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1. A cyclone separator for separating wood pieces and gas, comprising:

a cyclone housing defining an interior space and having an inlet for receiving a mixture of wood pieces and gas, and a first outlet for exhausting gas and a second outlet from which wood pieces exit the cyclone housing,

a vortex breaker in communication with the second outlet of the cyclone housing operable to separate the wood pieces from gas received from the cyclone housing,

a wood piece discharge device connected to a side of the vortex breaker opposite to the second outlet of the cyclone, and

a deagglomerator positioned within the vortex breaker operable to break up wood piece masses entering the vortex breaker into smaller wood piece masses or individual wood pieces or both before reaching the wood piece discharge device.

2. The cyclone separator of claim 1, wherein the deagglomerator comprises at least two rotary members positioned in a spaced apart relationship within the vortex breaker, a plurality of integral rigid fingers extend from each rotary member along a longitudinal length of each rotary member, and the rotary members are operably positioned for rotation wherein fingers of each rotary member pass through spaces provided between fingers on the other rotary member with clearance from the other rotary member.

3. The cyclone separator of claim 1, wherein the
fingers extend generally radially from the rotary
5 members.
4. The cyclone separator of claim 1, wherein the rotary
members are fixed for rotation within the vortex breaker
such that the rotary members extend generally
10 perpendicularly to a central axis of the cyclone housing.
5. The cyclone separator of claim 1, wherein the wood
piece discharge device comprises an air-lock having a
rotatable part comprising multiple wood piece-receiving
15 pockets integrally positioned around the circumference of
a rotary support, a stationary part comprising a housing
for the rotatable part wherein the housing includes upper
and lower openings whereby one pocket can be rotated into
position for receiving wood pieces at the upper housing
20 opening while another pocket is positioned at the lower
housing opening for dispensing wood pieces in a
substantially air tight manner.
6. The cyclone separator of claim 1, wherein the first
25 outlet for exhausting gases further comprises a
cylindrical portion extending into a radially central
portion of the interior space of the cylindrical housing
a vertically adjustable distance.

7. A method of separating wood pieces from gas,
comprising:

feeding a mixture of wood pieces and gas into a
cyclone housing defining an interior space and having an
5 inlet for receiving the mixture of wood pieces and gas,
and an upper outlet and a lower outlet, wherein the wood
pieces spiral down the cyclone housing until exiting the
cyclone housing via the lower outlet and entering an
adjoining vortex breaker;

10 disrupting spiral motion of the wood pieces in the
vortex breaker;

providing a wood piece mass deagglomerator within
the vortex breaker;

operating the deagglomerator effective to break up
15 wood piece masses entering the vortex breaker into
smaller wood piece masses or individual wood pieces or
both before reaching a wood piece discharge device;

discharging the deagglomerated wood pieces with a
wood piece discharge device connected to a side of the
20 vortex breaker opposite to the second outlet of the
cyclone.

8. The method of claim 7, wherein providing the
deagglomerator comprises positioning at least two rotary
25 members in a spaced apart relationship within the vortex
breaker, wherein a plurality of integral rigid fingers
extend from each rotary member along a longitudinal
length of each rotary member.

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9. The method of claim 8, wherein operating the deagglomerator comprises rotating the two rotary members wherein fingers of each rotary member pass through spaces between fingers on the other rotary member with clearance
5 from the other rotary member effective to break up clumps of wood pieces that enter the vortex breaker.

10. The method of claim 8, wherein the fingers extend generally radially from the rotary members.

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11. The method of claim 8, wherein providing the deagglomerator further comprises arranging the rotary members within the vortex breaker such that the rotary members extend generally perpendicularly to a central
15 axis of the cyclone housing.

12. The method of claim 7, wherein the wood piece discharge device comprises an air-lock having a rotatable part comprising multiple wood piece-receiving pockets
20 integrally positioned around the circumference of a rotary support, a stationary part comprising a housing for the rotatable part wherein the housing includes upper and lower openings whereby one pocket can be rotated into position for receiving wood pieces at the upper housing
25 opening while another pocket is positioned at the lower housing opening for dispensing wood pieces in a substantially air tight manner.

13. The method of claim 7, wherein the feeding of the
30 mixture of wood pieces and gas comprises directing the wood pieces and gas via the inlet tangentially against an inner wall of the cyclone housing.

14. The method of claim 7, wherein the rotary members continuously rotate at a speed of approximately 20-30 rpm.

5 15. The method of claim 7, wherein the wood pieces are selected from at least one of wood strands, wood chips, wood wafers, and wood particles, and combinations thereof.

10 16. The method of claim 7, wherein the wood pieces comprise wood strands.